

Dover/Kent County MPO Pedestrian Study, Dover High School

CEI Project Number: 135000.00



CONCEPT DESIGN REPORT July 2013

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Introduction

The Dover/Kent County Metropolitan Planning Organization (MPO) and the City of Dover requested a pedestrian study be performed to determine the pedestrian needs surrounding the new Dover High School being constructed on Forrest Avenue (SR8). The study looked at the roadways within a two-mile radius of the high school to determine where there are missing pedestrian facilities that would prevent students from safely walking to/from the school. Conceptual plans and cost estimates were developed so funding sources can be secured and improvements potentially constructed prior to the opening of the school in August 2014.

The roads that are included in the study are:

1. Forrest Avenue (SR8) between the proposed high school and Mifflin Road
2. Mifflin Road between Forrest Avenue and Hazlettsville Road
3. Hazlettsville Road between Mifflin Road and Cannon Mill
4. Kenton Road from Forrest Avenue to Walker Road

Subsequent studies will look at existing pedestrian facilities to determine their condition and if they meet current American with Disabilities Act (ADA) standards.

Project Kickoff

A meeting was held on March 28, 2013, with the representatives from the City of Dover, MPO, DelDOT and the Capital School District to discuss the scope of work and set priorities. The group recognized that there is limited funding to make pedestrian improvements and therefore must identify the locations of the most need.

The School District provided information on the developments and number of potential students within the 2 mile radius from the school which would be able to use the sidewalks. The information showed a large number of potential students lived in the subdivisions on the north side of Forrest Avenue (SR8). Based on these numbers, DelDOT Traffic agreed that the warrants for a High-Intensity Activated crosswalk beacon (HAWK) were met and it would be installed at the proposed eastern entrance to the high school property. This would provide the students on the north side of SR8 a signalized crossing at the school.



Existing Hawk Signal on SR72 in Newark

The group determined that the priority sections for pedestrian improvements would be along SR8 to provide direct connections to the school or the proposed HAWK signal. There are two sections where sidewalk is missing along the north side of SR8 and one on the south side. It was noted at the meeting that if these sections of

sidewalk are not installed then the district will be required, by state law, to provide buses to transport the students. This would increase the District's operating cost and make it difficult to encourage students to walk in the future since they would be accustomed to the busing.

The remaining roads in the study area are still important to the group so a complete network of accessible pedestrian walkways, not only for the school, but also for the City can be established.

Existing Conditions

The following table provides information on the study roadways:

Roadway	Classification	AADT (2012)	MPH
Forrest Ave (SR8)	Minor Arterial	18,316	40/50
Mifflin Road	Local	15,663	35
Hazlettsville Road	Major Collector	4,571/15,013*	45
Kenton Road	Minor Arterial	10,240	40

AADT = Average Annual Daily Traffic

* East of Wyoming Mill Road

Existing Right of Way Width:

Forrest Ave (SR8)	60 Feet
Mifflin Road	60 Feet
Hazlettsville Road	Varies, 60 Feet Minimum
Kenton Road	Varies, 60 Feet Minimum

Method of Analysis

Century Engineering researched the existing subdivision and roadway plans, including the proposed Dover High School site plan, to obtain a general location of the existing right of way. The right of way was plotted on aerial photographs to provide the basis for the concept plan development.

Field views were performed to document existing conditions, identify potential areas of concern and to evaluate alternatives for creating a pedestrian system. Additional field work was performed to review stormwater, drainage and utility features.

For stormwater management, background information including the web soil survey and the DelDOT National Pollutant Discharge Elimination System (NPDES) viewer was analyzed. This background information provides an overview of existing conditions within the project area. The NRCS web soil survey program provides ratings of soils, from A to D, based upon their suitability to retain and infiltrate water. A soils, which are typically sands, have the best infiltration rates and are well-suited for infiltration practices, whereas D soils are typically clayey material or areas with high groundwater, and typically are not acceptable for infiltration practices or permeable concrete. During the field view a soil probe was used to sample soil conditions to a depth of 36-inches, where possible, and options for stormwater quality analysis were identified.

It was assumed that a 10% waiver for quantity management can be obtained; therefore quantity management options were not investigated.

The field work was discussed and incorporated into the base plan for further analysis. The following three alternatives for a five (5) foot sidewalk were progressed and reviewed on the basis of constructability, right of way, impacts to existing features, cost and time to construct.

- Sidewalks adjacent to curb (new or existing)
- Sidewalks with 3' grass buffer behind curb
- Sidewalks with 5' grass buffer and no curb

With a few exceptions, where existing conditions were matched, the preferred option was to place the sidewalk adjacent to the curb. This reduced impacts to right of way, limited clearing of trees including private landscaped areas and generally had lower costs. The curb also helps to define the location of the sidewalk and provides a physical separation between the sidewalk and the roadway.

All costs were based on DelDOT standard items and unit rates. Right of Way prices were evaluated based on recent easements acquired for utility work along Forrest Avenue. The conceptual costs are included in Appendix A.

Proposed Improvements

Forrest Avenue (SR8)

Forrest Avenue is a two lane road with shoulders and right turn lanes into the fronting subdivisions. Separate left turn lanes do not exist within the study limits (a left turn lane into Cranberry Run exists just beyond the western limit of the study area). The road carries a large volume of traffic including large trucks and some Amish buggies that utilize the shoulders. Sidewalks and pathways exist within the study area but there are missing sections and a continuous pedestrian route does not exist between the new High School and Mifflin Road. Along this portion of the road there are no commercial facilities, but several residential homes front the roadway. All subdivisions are located on the north side of Forrest Avenue. Numerous above and underground utilities exist on both sides of the roadway.

Background information for soil survey indicated that soils in the area of the proposed sidewalks along Forrest Avenue are predominantly B soils, with some areas of C and D soils. Tests performed in the field confirm this condition. No indication of groundwater was found in any of the samples. Properties drained both to the road and away from the road. It appears that the closed drainage system drains into the subdivisions along the north side of Forrest Avenue. Approximately half of these subdivisions have stormwater management systems.

Forrest Avenue was divided into two sections, the north (Phase 1) and south (Phase 2) sides of the road. As referenced in Appendix B, Phase 1 has been subdivided into two sections that do not have existing sidewalks:



North Side of SR8 Looking East

Phase 1A – Marsh Creek Lane to Heatherfield Way

Phase 1B – Stoney Drive to Cranberry Run Drive

Phase 1A consists of installing approximately 625' of sidewalk behind the existing curb. The sidewalk fits well in this area and there are no anticipated impacts to existing drainage. There are a couple of utility poles that the sidewalk may have to bend around to maintain its five foot width.

Additional sidewalk may have to be placed behind some mailboxes to keep a 5 foot clear area. Another consideration would be to rotate the mailboxes 90 degrees so they are parallel to the sidewalk. The local Postmaster will need to be consulted with before this change can be done.

Permanent Easements (PE) may be needed to accommodate the locations where sidewalk will be placed behind the utility poles or mailboxes. These are very small areas and are much less costly than having to provide an area to relocate the utility poles.

Temporary Construction Easements will be required to tie the proposed sidewalk back to existing grades and adjust driveways to match the existing sidewalk grade. These areas are relatively small.

Since the existing drainage is not being altered and the area of disturbance is less than 5,000 square feet (SF), there are no anticipated stormwater management (SWM) or drainage requirements at this location. A stormwater management waiver will need to be obtained from DelDOT for improvements within DelDOT Right-of-Way, and Kent Conservation District for all others.

Phase 1B consists of installing approximately 900' of sidewalk, 250' of which will be behind the existing curb. In the remaining 650', new curb and gutter is proposed and the sidewalk would be installed adjacent to the curb.

In the section near Cranberry Run Drive, it is recommended that the sidewalk have a 3' buffer to match the existing sidewalk and avoid existing utility poles.

A portion of the proposed sidewalk, about 250', will be along a steep slope adjacent to a cultivated field. This study prepared two alternatives for this location. The first would be to place curb openings that would flow under the sidewalk and to the bottom of the slope. A shallow, defined swale would be constructed at the toe of the slope that would run to the existing

crossroad ditch. This alternative would require a permanent easement so that the ditch can be maintained. This likely will encroach upon the cultivated area.

The second alternative would minimize or eliminate the need for a PE. The plan would be to construct a small (2'-3') retaining wall behind the sidewalk. Drainage could be handled with a couple of inlets and pipe along the curb or a system behind the sidewalk. This alternative is more costly but might be needed if the easements cannot be obtained.



North Side of SR8 Looking West toward Cranberry Run

Both alternatives will need Temporary Construction Easements to tie the proposed sidewalk back to existing grades and adjust a driveway to match the existing sidewalk grade.

There is a crossroad pipe and ditch that runs perpendicular to SR8. There is sufficient room for the sidewalk to be placed above the pipe but a railing and possibly a headwall will be needed to protect pedestrians from the drop-off. An environmental permit may be required if work is needed along the ditch line. This concept assumes that riprap can be placed to stabilize the slope and the existing waterline will not be impacted so no permit, only coordination, would be required.

Since the existing drainage is still being directed to its original outfall location and the area of disturbance is less than 5,000 SF, there are no anticipated stormwater management requirements at this location. A stormwater management waiver will need to be obtained. To provide additional SWM treatment a five-foot wide grass strip along the downstream side (when not flowing toward the road) of the sidewalk could be installed. Some additional easements may be needed for this treatment. A minor drainage evaluation will need to be performed to verify the



South Side of SR8 Looking East toward Mifflin Road

size and location of any swales, inlets and pipes.

DelDOT is currently working on the design for both sections of Phase 1 and expect the work to be completed by the summer of 2014.

Phase 2 consists of installing approximately 1,500' of sidewalk behind the existing curb. There is an existing closed drainage system that includes drainage inlets along the road

and some field inlets. Within the sidewalk corridor there are conflicts with existing trees, mailboxes, landscaping, utility poles and streetlights. This plan calls for reducing the sidewalk width to four feet in front of some of the utility poles to avoid the need to relocate the utilities or obtain easements. The sidewalk would be widened around the mailboxes to keep a clear area of five feet. As noted in Phase 1, another consideration would be to rotate the mailboxes 90 degrees so they are parallel to the sidewalk. The local Postmaster will need to be consulted with before this change can be made. The landscaping features would need to be coordinated with the individual property owners. The design will minimize the impacts as much as possible, but most of the landscaping extends along the driveways and into the state's right of way. Approximately six street lights would need to be relocated to a location behind the proposed sidewalk. Due to the addition of the sidewalk, some existing field inlets would need to be shifted so they are not located against the proposed sidewalk. This can be accomplished by adding junction boxes, and new inlets with short runs of pipe.

The pedestrian signals at the intersection of SR8 and Mifflin Road would need to be upgraded to accommodate pedestrians crossing Mifflin Road. This work includes constructing a new pork-chop island on the southwest corner, modifying the island on the southeast corner and adding pedestrian signals to both corners.

Many property owners on the south side of SR8 have recently been paid to have utility easements located along the frontage of their property. These easements were needed for the upgraded utilities to support the new high school and were paid by the School District.

Permanent easements (PE) may be needed for the sidewalk along its western limits as it ties into the proposed east entrance to the high school. Small easements may also be needed to accommodate the locations where sidewalk would be placed behind the mailboxes or new field inlets are placed.

Temporary Construction Easements would be required to tie the proposed sidewalk back to existing grades and adjust driveways to match the existing sidewalk grade.

Since there are only a few field inlets that might be modified a drainage summary report would be the only required drainage documentation. Since the work is over 5,000 SF SWM will be needed to address water quality. It is recommended that the project manager meet with the delegated agency (DelDOT, DNREC) to discuss the possible options. Revisions to DNREC's Sediment and Stormwater Regulations will go into effect January 2014. Recommendations for stormwater management include:

- Demonstrate existing stormwater management systems provide adequate treatment as currently designed. This approach may require a shared use agreement.
- Place a five-foot wide grass strip between new sidewalk and drainage flow that functions as a filter strip (would not apply if drainage flow is toward the road since the sidewalk is adjacent to the curb). Additional easements may be required.
- Perform offset analysis (if under new regulations) or perform watershed level quality analysis (if under current regulations). This would require extra treatment of existing impervious elsewhere. SWM performed at the new high school may be used as a credit.

Mifflin Road

Mifflin Road is a two lane road with shoulders that vary from 6' – 8'. The existing shoulders are heavily used by pedestrians to go between Hazletville Road (including Schutte Park) and Forrest Avenue. Sidewalk exists at either end of the limits on the east side. There is a small roundabout about 1,400' south of Forrest Avenue at Woodmill Drive. In addition to the two subdivision entrances there is also a commercial entrance near Forrest Ave; all on the east side. The majority of the road is fronted by residential dwellings that have their access on Mifflin Road.

All utilities are underground, so there are no utility poles along the corridor. Street lights along the eastern side of the road would have to



Existing Roundabout on Mifflin Road

be relocated or replaced as part of the sidewalk project. Both ends of Mifflin Road are controlled by traffic signals.



Sidewalk from Mifflin Road to Village of Westover
connection to the new high school.

Mailboxes exist on both sides of the road. At these locations the sidewalk can be widened or the mailboxes rotated (with approval from the Postmaster) to remove the obstruction.

There is an existing sidewalk that connects Mifflin Road to the Village of Westover. The connection is approximately 400' north of the roundabout. The Village of Westover has internal sidewalks and a

Surveys indicated that soils in the area of the proposed sidewalks along Mifflin Road are entirely B soils. Probes performed in the field did not confirm this condition. Eight (8) probes were performed, with most probes showing a clayey sand soil. Three (3) samples, near the outfall south of the roundabout, had groundwater within a depth of 3 feet of the surface. Properties generally drained away from the road, with several properties having large low areas that do not drain. Existing drainage along the east side of Mifflin Road drains to a large concrete lined swale that would be considered a “waters of the US”. The west side has a limited open system that drains to low points on the west side of the road. Water sits at these locations and infiltrates.



East Side of Mifflin Road Looking North

Phase 1 – East side of Mifflin Road

The proposed pedestrian improvements along the east side of Mifflin Road include adding approximately 3,000 feet of curb and 5 foot sidewalk. A buffer strip is not proposed to reduce the possible impacts to existing utilities (much of the above ground apparatus are set back from the road) and the distance to tie back into existing grades. By reducing the distance to match existing grade less landscaping and existing trees will be impacted.

There is an existing closed drainage system along much of the east side of Mifflin Road. The proposed work will tie into the existing drainage system by using curb openings and adjusting the existing inlets. Approximately 860 feet of new drainage pipe would be required in the area where no drainage system exists. Minor grading along the frontage of the properties would be required.

A mid-block pedestrian crossing is proposed at the existing sidewalk to the Village of Westover. This crossing, and its location, would have to be approved by DelDOT's Traffic Section. This location was selected because vehicles were at slower speeds near the roundabout and there were no conflicts with turning vehicles. The roundabout was considered for the crossing but due to the size of the roundabout it is difficult for pedestrians to recognize if a car is turning while also being difficult for cars in the queue to react to those stopping for pedestrians in a crosswalk.



Existing Concrete Swale East Side Mifflin Road

Temporary Construction Easements (TCE) and Permanent Easements (PE) are anticipated for the proposed work. TCE's will be required to tie the proposed sidewalk and driveways back to existing grade. PE's will be required where the sidewalk is tying in to existing sidewalk or where it may move behind utility apparatus. PE's may also be needed to provide a location for a utility that needed to be relocated (hydrant, electric or telephone box).

Since the work is over 5,000 SF SWM will be needed for quality. It is recommended that the project manager meet with the delegated agency (DelDOT, DNREC) to discuss the possible options. Recommendations include:

- Perform stream restoration on the existing concrete swale and remove concrete lining, provide plantings, and provide stream enhancements. This work would provide treatment for approximately 30% of the sidewalk, but would provide treatment for the existing road, thereby creating a quality treatment credit. This work would require United States Army Corps of Engineers (USACE) permits and easements.
- Place a five-foot wide grass strip adjacent to the new sidewalk in the direction of the drainage flow that functions as a filter strip (would not apply if drainage flow is toward the road since the sidewalk is adjacent to the curb). Additional easements may be required.
- Perform offset analysis (if under new regulations) or perform watershed level quality analysis (if under current regulations). This would require extra treatment of existing impervious elsewhere. SWM performed at the new high school may be used as a credit.

Phase 2 – West side of Mifflin Road

The proposed pedestrian improvements along the west side of Mifflin Road include adding approximately 3,100 feet of curb and 5 foot sidewalk. A buffer strip is not proposed to reduce the possible impacts to the existing properties. The drainage on the west side of Mifflin Road is predominately an open system consisting of shallow, poorly drained swales. There is a trench drain system at the roundabout that can be utilized. There is little evidence of utilities under the shoulder (manholes, valves, junction wells); most appear offset from the road. Based on these factors a closed drainage system is proposed. This would include installing approximately 3,000 feet of drainage pipe and corresponding inlets. The existing swales would be filled and the frontage of the properties that drain toward the road graded to drain into the new system.

Temporary Construction Easements (TCE) and Permanent Easements (PE) are anticipated for the proposed work. TCE's will be required to tie the proposed sidewalk, drainage swale and driveways back to existing grade. PE's will be required for some drainage connections, utility relocations and possibly sidewalk/signal work at the intersection with Forrest Avenue (dependent upon right of way verification).

Since the work is over 5,000 SF SWM will be needed for quality. It is recommended that the project manager meet with the delegated agency (DelDOT, DNREC) to discuss the possible options. Recommendations include:

- Place a five-foot wide grass strip adjacent to the new sidewalk in the direction of the drainage flow that functions as a filter strip (would not apply if drainage flow is toward the road since the sidewalk is adjacent to the curb). Additional easements may be required.

- Perform offset analysis (if under new regulations) or perform watershed level quality analysis (if under current regulations). This would require extra treatment of existing impervious elsewhere. SWM performed at the new high school may be used as a credit.



West Side of Mifflin Road looking South



Intersection of Mifflin Rd & Forrest Ave

Hazlettsville Road

Hazlettsville Road is a two lane road with shoulders and auxiliary turn lanes at the signalized intersections. Sidewalk exists on both sides of the road but there are missing sections between Mifflin Road and Cannon Mill Drive. The existing sidewalk is setback off the roadway. The sidewalk provides a direct connection to Schutte Park and the subdivisions on the north side have internal pedestrian access to the new high school. Within the study limits, there are six residences and an electric substation that have their access along Hazlettsville Road. All other access is through the subdivision entrances. Both underground and aerial utilities exist along the roadway. Mailboxes exist at the driveways of the residential properties.

Background information indicated that soils in the area of the proposed sidewalks along Hazlettsville Road are predominantly B soils with a few areas of C soil. Probes performed in the field did not confirm this condition. Four (4) probes were performed. Two probes performed in the location of the sidewalk near Mifflin Road showed clayey sand. Two probes performed in the area of the proposed sidewalk in front of Nottingham Meadows showed a silty sand material that is most likely stockpiled topsoil and fill from the construction of Nottingham Meadows. Groundwater was not found within either probe, although the areas where proposed sidewalk is proposed near Mifflin Road showed clear signs of long-term ponding water. Properties on the north side of the road generally drained away from the road, with several properties having large low areas that do not drain. Properties on the south side drained toward the road, due to a large berm placed in front of Nottingham Meadows.



North Side Hazlettsville Rd, West of Mifflin Rd

There are two locations where sidewalk is missing along Hazlettsville Road. They have been broken into two phases:

Phase 1 – North side just west of Mifflin Road

Phase 2 – South side just west of Wyoming Mill Road

Phase 1 consists of installing approximately 500' of sidewalk behind a proposed curb. Ideally the sidewalk would be offset from the road at the point where the existing sidewalk ends to Mifflin Road. However, two residential properties, (see plan sheet in Appendix B), are set close to Hazlettsville Road and their property extends close to the roadway (adjacent properties have right of ways that are set back from the road). Therefore permanent easements to cut through their front yards would be required. Since this study was trying to minimize impacts to right of way the sidewalk was placed closer to the road. This option should still be considered and the property owners approached to confirm their position.

New drainage pipe would be installed and tied in to the field inlet just west of the sidewalk limits. There are existing underground utilities so coordination with the utility companies would be needed to avoid impacts. The sidewalk can be widened where existing mailboxes exist to provide proper clearance.

Permanent Easements (PE) would be needed to accommodate the new sidewalk at the two residential properties previously noted. A PE will also be required to tie the sidewalk into the existing.

Temporary Construction Easements will be required to tie the proposed sidewalk back to existing grades and adjust driveways to match the existing sidewalk grade. For this location these areas are relatively small.

Since the area of disturbance is less than 5,000 SF, there are no anticipated stormwater management or drainage requirements at this location (A stormwater management waiver will need to be acquired).

Since an existing drainage system is proposed to be tied into, a drainage analysis will need to be completed to confirm that the existing system has the capacity to handle the additional water. From field views, it appears that some of the drainage where the sidewalk is proposed drains to the inlet.



South Side Hazletville Rd Looking towards Wyoming Mill Rd

Phase 2 consists of installing approximately 700' of sidewalk which would be offset from the roadway. The sidewalk would tie into the existing sidewalk which has a three foot offset from the road. The sidewalk would then shift farther away from the roadway to be on top of an existing berm on the backslope of the drainage swale. The sidewalk would connect to the existing curb ramp at Wyoming Mill Road. No changes to the signals or intersections are required.

There are existing underground utilities the sidewalk will have to cross so coordination with the utility companies will be needed but no conflicts are anticipated. No drainage work is expected since the sidewalk can be sloped to drain into the existing swale.

No new easements are anticipated since all work will be within state rights of way or within existing permanent easements.

Since the area of disturbance is less than 5,000 SF, there are no anticipated stormwater management requirements at this location. A stormwater management waiver will need to be acquired.

The new owner/developer of Nottingham Meadows will be responsible for installing this portion of sidewalk. DelDOT and the City of Dover will not be contributing to the work.



South Side Hazletville Rd in front of Nottingham Meadows



North Side Hazletville Rd, West of Mifflin Rd

Kenton Road

Kenton Road is a two lane road with shoulders and turn lanes. There is a mix of residential and commercial property within the study limits. Both ends of the study limits are controlled by traffic signals. Underground and aerial utilities exist on both sides of Kenton Road.

There are existing sidewalks along both sides of the road but they are not continuous. Appendix B shows the locations of the existing sidewalks within the corridor.

Background information indicated that soils in the area of the proposed sidewalks along Kenton Road are predominantly B soils, with some areas of C and D soils. Probes performed in the field confirm this condition. Six (6) probes were performed, with the results being highly variable. Probes within the area mapped as B soils were generally a sand with silt, while probes within the area mapped as C and D soil were generally silty sands, trace clay. Properties drained both to the



road and away from the road. The existing drainage along this section of Kenton Road outlets to a rip-rap swale behind Westwind Meadows subdivision.

Phase 1 – East side of Kenton Road from SR8 to Walker Road

The proposed pedestrian improvements along the east side of Kenton Road include adding approximately 1,450 feet of 5 foot sidewalk. The sidewalk would be installed behind existing or new curb. A buffer strip is not proposed to reduce the impacts to right of way.

Significant grading and the clearing of mature

East Side Kenton Road Looking toward Walker Road

trees would be required between Greentree Drive and Fieldstone Court, adjacent to English Village. The trees are on top of a berm that was likely placed to act as a buffer between Kenton Road and the town homes. The clearing of this area will require public involvement with the adjacent property owners. Landscaping should be placed behind the proposed sidewalk to replace the trees that would be removed. Additional research is required to determine the limits of existing right of way and easements. It is anticipated that both Temporary Construction Easements (TCE) and Permanent Easements (PE) will be needed for this work.

Between Fieldstone Court and the entrance to English Village curb openings would be required to tie into the existing closed drainage system. The existing inlets would need to be adjusted. Grading along the frontage of the property would be required.

North of English Village, at the Kent Swim Club, the ground slopes away from the roadway. We are proposing to add curb and approximately 600 feet of new drainage pipe. Due to the side



East Side Kenton Road, Looking toward Walker Road

slopes a low retaining wall (2' – 3') may be required to prevent impacts to the existing fence at the right of way line.

Temporary Construction Easements (TCE) and Permanent Easements (PE) are anticipated for the proposed work. TCE's would be required to tie the proposed sidewalk to existing sidewalk and to match existing grades. PE's would be required where the sidewalk is tying into existing and possibly along the

frontage of some properties. PE's may also be needed to provide a location for utility apparatus that needs to be relocated.

Since the work is over 5,000 SF SWM would be needed for quality. It is recommended that the project manager meet with the delegated agency (DelDOT, DNREC) to discuss the possible options. Recommendations include:

- Place a five-foot wide grass strip adjacent to the new sidewalk in the direction of the drainage flow that functions as a filter strip (would not apply if drainage flow is toward the road since the sidewalk is adjacent to the curb). Additional easements may be required.
- Perform offset analysis (if under new regulations) or perform watershed level quality analysis (if under current regulations). This would require extra treatment of existing impervious elsewhere. SWM performed at the new high school may be used as a credit.
- Demonstrate existing DelDOT stormwater management facilities at Walker/Kenton Roads provide adequate treatment for new sidewalk under the current design

Phase 2 – West side of Kenton Road from SR8 to Walker Road

The proposed pedestrian improvements along the west side of Kenton Road include adding approximately 2,000 feet of 5 foot sidewalk and curb. A buffer strip is not proposed to reduce the impacts to right of way. There are several locations where there are existing fences along the right of way. Both underground and aerial utilities are present within this corridor.



West Side Kenton Road, South of Walker Road

There is a long section of existing sidewalk (4 feet wide) from the middle of the Westwind Meadows property to Greenway Lane. It is assumed that this sidewalk will remain but it does not appear that it is being maintained. Weeds and leaves cover the sidewalk which is up against a fence. If funding were available replacing this portion of sidewalk and possibly the fence along it should be considered.

At Walker Road a pedestrian crossing will be required for the northern leg of the intersection. This would include modifications to the existing island and signals. Pedestrian signals would also be needed.

From Walker Road to the north side of Westwind Meadows, approximately 850' of new curb and sidewalk would be required. Since there is an existing drainage system curb openings would be used to channel the roadway runoff to the drains. The existing inlets will need to be adjusted and one may require conversion to a junction well. Grading and minor clearing along the back of the sidewalk would be needed and some street lights would have to be relocated.

There is a shallow swale and/or low area along the frontage of Westwind Meadows, some of which drains back to the inlet at the northern property line. The proposed improvements consist of approximately 600' of new curb, sidewalk and drainage pipe. The drainage would be tied into the existing system. Due to the bypass lane and existing fence there is limited space for the sidewalk. Temporary and/or permanent easements may be needed to construct and maintain the sidewalk depending upon verification of the right of way limits. Clearing and grubbing will be required to remove the overhanging vegetation. Existing fire hydrants and some telephone boxes would have to be relocated. These are assumed to be within the right of way but permanent easements may be needed to provide a relocation area.

Between Greenway Lane and Mifflin Road (approximately 550') there is existing curb and drainage so the sidewalk is proposed to be placed behind the existing curb. The most significant issue is that several private fences have been installed adjacent to the curb. Initial right of way research indicates that the fences may be encroaching upon state right of way. This would need to be verified before progressing. If the right of way allows, or easements can be obtained, the fences could be reset back to allow for at least a four, preferably a five, foot sidewalk. However, this must be coordinated with the property owners since it will impact their property. There are also some above ground utilities (electric & telephone boxes) that would need to be avoided or



West Side of Kenton Road, Looking South, Just North of SR8

relocated.

Other possible options to gain additional space for the sidewalk would include reducing the existing southbound lane widths or shifting the road to the east. Both of these options would require additional cost since new curb, drainage and repaving (to redo the pavement striping) would be required.

This proposal assumes that the sidewalks can be placed behind the curb, either within the right of way or in a permanent easement.

Since the work is over 5,000 SF SWM will be needed for quality. It is recommended that the project manager meet with the delegated agency (DelDOT, DNREC) to discuss the possible options. Recommendations include:

- Perform offset analysis (if under new regulations) or perform watershed level quality analysis (if under current regulations). This would require extra treatment of existing impervious elsewhere. SWM performed at the new high school may be used as a credit.
- Demonstrate existing DelDOT stormwater management facilities provide adequate treatment for new sidewalk under the current design

Summary

With the existing conditions the proposed work on Forrest Avenue and Hazletville Road are the most feasible projects. The projects have relatively low cost, minimal anticipated utility conflicts, minor easement requirements and are important links to complete a pedestrian facility to the new high school and destinations such as Schutte Park. In addition, the investment in the Forrest Avenue section will provide a cost savings for the School District, and State, by eliminating the need to bus students on the north side of Forrest Avenue. These projects could be added to the Transportation Alternative Program (TAP) or developed as standalone projects with the support of Capital Transportation Program (CTP) funds. Phase 1 of the Forrest Avenue improvements is currently being designed by DelDOT with an anticipated construction date of summer 2014.

Mifflin Road has a large number of pedestrians and is an important connection between the new school, Forrest Avenue and Schutte Park but due to its length and existing conditions (stormwater, utilities, public involvement) the cost of pedestrian improvements make this project a better fit under a capital project. One consideration that would be more cost effective would be to provide a sidewalk between the two residential entrances on the east side connecting to a mid-block crossing that aligns with the existing sidewalk on the west side. This will allow residents and students an opportunity to use an existing sidewalk system to get to the school without incurring all of the costs. As noted, this would require a new mid-block pedestrian crossing of Mifflin Road, which would require the approval of DelDOT's Traffic Section.

Kenton Road has several residential neighborhoods within the study limits that would benefit from improved pedestrian facilities. However the cost and potential impacts to rights of way

make this project a better candidate for a capital project. Public involvement and real estate activities (research, negotiations) will be a large component of the project. These activities are not best suited for TAP or other small programs.

Assumptions and Limiting Conditions

The following assumptions and limiting conditions were considered in the preparation of this conceptual plan package:

- Limits of existing right of way are estimated based on aerial maps, plotted information from previous highway plans and tax parcel information. This information needs to be reviewed in more detail under future design phases.
- Due to concerns about future maintenance and aesthetics the City of Dover does not support the use of porous concrete for Stormwater management
- No subsurface investigation was performed. Utility locations were determined from physical above ground features
- Topographic and property survey was not performed. Information contained herein regarding topographic features was obtained by site visit observation.



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